

Weekly Team Meeting 02/06

06 FEB 2020 / 2:30 PM / VLSI LAB

ATTENDEES

Dr. Ay, Dr.Li, Wei Hu, Zhicai Li, Yanqin Huang, Yuhang Dai

AGENDA

- Showing our progress in 3D modeling
- Discussing PWM modulation
- Building the test stage for the system

NOTES

- Showing our progress in 3D modeling
 - We learnt how to use the 3D printer and made some simple models.
 - We build the lens holder for the $D = 20\text{mm}$. $F = 25\text{mm}$ convex lens.
 - Next week, we will build the lens holder that can be fixed on the new testing stage.
- Discussing PWM modulation
 - We found that the Arduino can read the pulse width accurately for 90Hz signals which easier than read 1s and 0s
 - Therefore, we consider to use the pulse width to carry the information, however, there are many potential issues we may encounter:
 - The change in distance will change the pulse width when the duty cycles are the same. This is because the light intensity reduces due to increasing in distance. The solution is to fix the distance and adjust the 1s and 0s margine. The lens may be helpful to recover the true duty cycle.

- We need to find how many bits can be fitted into 1 duty cycle. This depends on the noise margin(minimum resolution that identifies two pulse widths in arduino). We estimated we can fit 2 bits.
- Another challenge is whether we can arduino to generate precise PWM signals from arduino. We will investigate it next week.
- Building the test stage for the system:
 - At the end of the meeting, Dr. Ay helped us to build a new test stage where we can fix the photodiode and the LED so that we can test the performance professionally and can repeat the results.
 - The maximum frequency we can obtain without room light is 140kHz at 10cm.

ACTION ITEMS

- We will focus on testing the performance of the photodiode module with lens this week.
- We will improve the performance on the LED modules to reduce the spikes as well as improve the driving of current.
- We will make a schematic file for the photodiode and LED modules so that we can fab on the same PCB board.